

ABSTRACT OF THE DISCLOSURE

A precision positioning device comprises a hydraulic cylinder extending along the vertical direction and a piston member accommodated in the cylinder. The inside of the cylinder is divided into two chambers by a piston head of the piston member. A hydraulic circuit supplies a fluid at a constant pressure to one of the two chambers and supplies the fluid at a controlled flow rate to the other of the chambers via a servo valve. A control system performs position control with respect to the piston member by controlling the servo valve based on a detection signal from the position sensor, a position command value, a velocity command value, and an acceleration command value. The control system also performs force control with respect to the piston member by controlling the servo valve using detection signals from the first and second pressure sensors and a load command value.